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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/549,329

07/24/2006

Henning Sirringhaus

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EXAMINER

OLSEN, KAJ K

ART UNIT

PAPER NUMBER

1724

NOTIFICATION DATE

DELIVERY MODE

10/28/2010

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

sughrue@sughrue.com  
PPROCESSING@SUGHRUE.COM  
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<b>Office Action Summary</b>	<b>Application No.</b> 10/549,329	<b>Applicant(s)</b> SIRRINGHAUS, HENNING	
	<b>Examiner</b> KAJ K. OLSEN	<b>Art Unit</b> 1724	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 August 2010.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 27, 28, 30-37 and 42-46 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 27 and 28 is/are allowed.
- 6) ☒ Claim(s) 30-37 and 42-46 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)         | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Specification***

1. The previous objection to the disclosure has been withdrawn in view of the amendment.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 30-37 and 42-46 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claims 30 and 42 are incomplete because they set forth the defining of a microchannel and a pair of electrodes in a single operation and followed by a step of placing a flow of liquid or gas in said microchannel, but fails to set forth the essential steps that must occur between this single operation and the use of the device has a sensor with a flow channel. In particular, all the layers 4, 5 and 6 shown in fig. 1A(III) that are placed down in the channel formed by the single operation before any gas or liquid is introduced into the channel and applicant has no step or steps drawn to providing any of these elements. The omission of these elements is critical for two reasons. First, the channel formed by the single operation is not the same channel utilized for the sensing of the liquid or gas. Namely, the channel formed by the single operation is shown in fig. 1A(II) has a height  $h$  and diagonal length  $L/2$ . The microfluidic channel that receives a flow of liquid or gas for the sensing however is the portion of this channel left after a number of after a number of additional layers are placed within this channel (i.e. the channel shown in fig.

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1A(II) is not the same channel as formed in fig. 1A(III)). Hence, the “said microfluidic channel” or “said channel” of claims 30 and 42 is not the same thing as the earlier microfluidic channel defined in a single operation. Second, amended claims 30 and 42 specify a step of sensing a property. The sensed property in the present invention is only possible after the transistor is assembled within the defined microchannel. In particular, the sensing property relies on the exposure of a liquid or gas to the gate electrode placed in the bottom of the formed flow channel. The claims do not disclose the formation of the sensing transistor and the examiner does not believe any sensing as disclosed by the present invention is even possible until the actual sensor is constructed. Neglecting to include limitations drawn to providing a sensing device when applicant claims a sensing step renders claims 30 and 42 incomplete. Although the examiner recognizes that the claims of the present invention are constructed with open language (i.e. comprising) and open claims need not recite any step necessary for performing the set forth method, the missing limitations discussed above are clearly critical to the set forth microchannel and sensing limitations as highlighted above.

5. The previous rejection of claims 27 and 35 has been withdrawn in view of the amendment to those claims.

### ***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an

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international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 30-37, 42 and 43 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Bhullar et al (USP 6,676,815) with evidence from White et al (USP 5,405,511). Bhullar and White are being cited and relied on for the first time with this office action. Their use here was necessitated by applicant's amendment to claims 30 and 42.

8. With respect to claim 30, Bhullar discloses a method comprising defining in a single operation (e.g. laser drilling) a channel having micrometer dimensions and a pair of electrodes of an electronic sensing device. In particular, Bhullar discloses the drilling of a hole through a body 12 having a rod of conductive material where the drilling step divides the rod into two electrodes 18 and 19. See col. 3, ll. 16-47. A channel having micrometer dimensions would read on the term "microfluidic channel". The sensor disclosed by Bhullar is then subsequently utilized by exposing the formed channel to a liquid and sensing a property of the liquid (col. 1, ll. 52-57 and col. 5, ll. 51-65).

9. With respect to claim 31, Bhullar discloses the use of any number of known machining methods for the single operation (col. 3, ll. 35-40). The substitution of embossing for the drilling of Bhullar would have required only routine skill in the art.

10. With respect to claim 32, see col. 8, ll. 7-10.

11. With respect to claim 33, see col. 5, ll. 51 and 52.

12. With respect to claim 34, White evidences that sensors like those of Bhullar are inherently sensitive to temperature (col. 1, ll. 18-21).

13. With respect to claim 35, see Table 1 of Bhullar.

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14. With respect to claims 36 and 37, absent limitations explicitly reciting the presence of a field-effect transistor (see the 112 rejections above), these claims are not deemed to further limit the actual claimed invention.

15. With respect to claim 42, see the discussion of claims 30 and 31 above.

16. With respect to claim 43, any process cutting the rod of Bhullar to provide micrometer dimensions would inherently constitute a process of microcutting.

#### *Allowable Subject Matter*

17. Claims 27 and 28 are allowed.

#### *Response to Arguments*

18. Applicant's arguments with respect to claims 30-37 and 42-46 have been considered but are moot in view of the new ground(s) of rejection.

#### *Conclusion*

19. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

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will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KAJ K. OLSEN whose telephone number is (571)272-1344. The examiner can normally be reached on M-F 6:00-2:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kaj K Olsen/  
Primary Examiner, Art Unit 1724

October 25, 2010